DOCUMENT RESUME

ED 294 385 EC 202 556

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TITLE Communicative Abilities of Disabled and Nondisabled Children.
PUB DATE Apr 87
NOTE 38p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Baltimore, MD, April 23-26, 1987).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Cognitive Processes; *Communication Skills; Elementary Education; Interaction Process Analysis; *Interpersonal Competence; *Learning Disabilities; *Learning Strategies; *Self Concept

ABSTRACT

The study evaluated the communicative abilities of 30 learning disabled and 30 nondisabled children (ages 9-13 years) in two communication tasks. The study also attempted to investigate the relationships among factors believed to influence such abilities and to identify subgroups of disabled children based on profiles derived from the following factors: skills in a referential task and a semi-structured dyadic interaction; self-perceptions of social acceptance, behavior/conduct, and self-worth; and cognitive processes as evidenced by intelligence test subscale scores. Statistical analyses supported the hypothesis that the communicative abilities and related self-perceptions of learning disabled children differ markedly from those of nondisabled children. In addition, the use of strategies, whether to narrow the comparisons needed in a referential task or to maintain engagement in a conversation, was found to play an influential role in subjects' success on the communication tasks. (Author/DB)

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Communicative Abilities of Disabled and Nondisabled Children

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Presented at the Annual Meeting of the Society for Research on Child Development, Baltimore, MD, April, 1987

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Abstract

Research suggests that many of the social difficulties evidenced by learning disabled children may result from their communicative behaviors. The purpose of this study was to characterize the abilities of disabled and nondisabled children in two communication tasks, to investigate the relationships among factors believed to influence such abilities and to identify subgroups of disabled children based on profiles derived from their: skills in a referential task and semi-structured dyadic interaction, self perceptions of social acceptance, behavior/conduct and self-worth and cognitive processes as evidenced by WISC-R subtest scores. Sixty subjects (30 disabled and 30 nondisabled), drawn from three middle-class suburban school systems and ranging in age from 9 to 13 years participated in the study. Statistical analyses supported the hypotheses that the communicative abilities and related self-perceptions of learning disabled children differ markedly from those of nondisabled children. In addition, the use of strategies, whether to narrow the comparisons needed in a referential task or to maintain engagement in a conversation, was found to play an influential role in subjects' success on the communication tasks. This study provides new information by focusing on multiple forms of communication and investigating relationships among communicative behaviors, cognitive and affective factors. Further, it contributes to an understanding of the communicative skills of disabled and nondisabled children by providing clarification of the similarities across, and differences between, the abilities of these children.

Communicative Abilities of Disabled and Nondisabled Children

The past decade has seen a dramatic increase in the number of studies addressing the social skills and behaviors of children with learning disabilities. As a result of these studies, a number of discrete skills and processes have been identified as being either underdeveloped in or inappropriately employed by these children. Of these skills, the communicative abilities of learning disabled children have been reported as determining, to a large extent, their social competence (e.g., Bryan, Wheeler, Felcan & Henek, 1976; Donahue & Bryan, 1983; Donahue, Pearl & Bryan, 1980; Speckman, 1981).

Communication means "to make common or shared," which entails not only exchanging information, but also sharing a social bond and a definition of the communicative relationship. Communicative competence depends at the very least on the intersection of social knowledge and linguistic ability. That is, competent communicators possess a knowledge of the structure, meaning and function of sentences, an awareness of the structure and meaning of aspects of the social world, and more importantly, the ways in which these two knowledges intersect during a social interaction (Hymes, 1971). In addition, sophisticated communicators have available the strategies and skills required to employ these knowledges flexibly, efficiently and appropriately in a wide variety of situations. Traditionally, communiation has been studied from either a psychological or sociolinguistic perspective. In the former, research has focused primarily on the referential skills of the child (e.g., Flavell, Speer, Green & August, 1981), while in the latter attention is on the manner in which social context affects the expressison and understanding of messages by language users (Ochs, 1979).

Research addressing the referential communication abilities of learning disabled children indicates that these children perform significantly poorer than nondisabled children of the same age (e.g., Bryan & Pflaum, 1978; Donahue, Pearl & Bryan, 1982; Noel, 1980). Messages produced by learning disabled children have been found to be not only less complex linguistically, but also very different from their nondisabled peers in terms of message content. That is, the messages of disabled children do not typically contain descriptions that focus on the critical attributes of the referent, thus making it difficult for the listener to make the necessary referent/nonreferent distinctions. Generally, the information contained in the messages produced by learning disabled children is repetitive, contradictory or unrelated to the communication task (Speckman, 1981).

The discourse and pragmatic abilities of learning disabled children have only recently received attention. Research findings suggest that these children, when compared to nondisabled peers, initiate dialogue and introduce topics less frequently (Friel-Patti & Conti-Ramsden, 1984), request additional information, clarification, elaboration or repetition of information less consistently (e.g., Donahue et al., 1980; Speckman, 1981; Speckman & Roth, 1982), and appear to be more hostile and less cooperative conversational partners (e.g., Bryan & Bryan, 1978; Bryan et al., 1976). Additionally, learning disabled children have exhibited difficulty with maintaining a dominant or assertive position in a communicative interaction (Bryan, Donahue & Pearl, 1981; Bryan, Donahue, Pearl & Sturm, 1981; Donahue, Pearl & Bryan, 1980).

A major weakness in the research that has been conducted on the communicative abilities of children in general, and of learning disabled children specifically concerns the manner in which communicative competence

has been investigated. There appears to be a dichotomy in research approaches, that is, psychological vs. sociological, referential vs. pragmatic. If one considers the nature of communication, it is apparent that such a duality is false. That is, when people come together to communicate, they do so to accomplish some purpose; they make use of their abilities to transmit social and referential meaning implicitly and explicitly, verbally and nonverbally, and they make judgments and inferences about the meaning of verbalizations in relation to the context in which they are interacting (Erickson, 1981).

Rather than continuing to study communicative competence as either referencing or pragmatic ability, research in this area should investigate how the referential, directive and social functions of language are related, and how the social rules governing the use of language influence communicative ability (e.g., Dickson, 1981; Gleason & Weintraub, 1978). Both approaches have a strong methodological history and have contributed to an understanding of children's communicative abilities. If, however, the broader, more naturalistic focus of the pragmatic approach was coupled with the more discrete, quantitative skills approach of the referential tradition, it is possible that children's communication would be understood in greater detail.

In addition, it is necessary to judge children's communicative abilities in light of their capacities in areas that appear to be logically related to communication. For instance, a number of discrete cognitive skills and processes thought necessary for mature communication (e.g., categorization, perceptual and verbal comparison, labeling, and message comprehension) have been identified as necessary for the development of communicative skill, yet there have been few attempts to more clearly specify the nature of the

relationship between these discrete abilities and children's general communicative success. Additionally, the development of communication skills is an integral part of social development and influences a child's social acceptance (Donahue, 1985), and yet the role played by such affective factors as self-worth in a child's communicative ability has not been investigated.

The goals of this study were: to characterize the communicative abilities of learning disabled and nondisabled children in two communication situations, to investigate the relationships among factors that influence such abilities and to identify subgroups of learning disabled children based on performance profiles derived from their: a) communicative skills in a referential task and a semi-structured dyadic interaction, b) self perceptions of social acceptance, conduct/behavior and self-worth and c) cognitive processes as evidenced by WISC-R subtest scores. Three hypotheses were tested.

First, based on prior research findings (e.g., Donahue, et al., 1981; Noel, 1980) it was expected that nondisabled subjects would receive higher, more positive overall scores than learning disabled subjects on both the referential and semi-structured communication tasks. Second, it was expected that nondisabled and disabled subjects would differ significantly not only in their level of performance across the 5 communication task scores (i.e., success and efficiency scores for the familiar referential figures, success and efficiency scores for the abstract referential figures and communicative interaction score derived from the semi-structured dyadic interaction), but also in the patterns of their performance across these tasks. Third, it was anticipated, on the basis of prior research (e.g., Johnson, 1981; Kronick, 1981), that nondisabled subjects would report higher

self-perceptions of general self-worth than would the learning disabled subjects. In addition, it was expected that nondisabled subjects would also report more positive self-perceptions of their social acceptance and behavior/conduct as compared to the disabled subjects.

In addition to testing these three hypotheses, two questions of interest were explored in this study. First, the interrelationships among communicative, affective and cognitive factors were investigated. The second question explored in this study concerned the feasibility of identifying subgroups of learning disabled children on the basis of profiles derived from their performance on the measures employed in this study.

Methods

Subjects

Subjects in this study were 60 children (30 learning disabled and 30 nondisabled). Target subjects were drawn from elementary and junior high classrooms in three middle class suburban school systems and ranged in age from 9 years to 12 years 11 months ($\bar{x}$ = 10 yrs. 10 m.). Learning disabled subjects were selected from self-contained learning disabilities classrooms, and had been identified for special services on the basis of the New York State Education Department's (1980) definition of a learning disability. Nondisabled subjects were chosen from regular elementary and junior high school classes in the same school districts and were matched with learning disabled subjects for age, +/- 3 months, and IQ, +/- 10 points. Additionally, nondisabled subjects were matched with disabled subjects by sex in such a way that the proportion of male to female subjects (14 males, 16 females) was identical in the two groups. Nondisabled subjects also had no prior history of having received special educational services.

Additionally, 60 nondisabled children chosen according to the selection criteria used for the nondisabled subjects participated as partners to the 60 subjects.

Procedures

Learning disabled and nondisabled subjects were matched with same-age, same-sex nondisabled partners. Subjects and partners were asked if they had ever been in a class together. Dyads answering in the affirmative were identified as "familiar". Both communication tasks took place in a room away from other children, and relatively free from disturbing noises. The investigator was in the room with the target child and his partner and made detailed notes of the subjects' behaviors as they engaged in the communication tasks.

The initial activity for these dyads was the referential communication task. In this measure, subjects interacted with their partners in a communication setting requiring them to describe a set of eight figures. Subjects and peers were seated at individual tables facing away from one another. Each participant (i.e., subject and partner) was given a set of 12 - 5x8" index cards on which the 8 target figures and 4 additional figures were printed. Subjects in the role of speaker were instructed by the experimenter to describe one of the 12 figures in such a way that his partner would be able to choose the matching figure from among his 12 cards. Partners in the role of listeners were instructed to give general feedback concerning the adequacy of the subject's message. That is, the listener/partner could indicate either that the message contained enough information for figure selection or that more information was needed before a match could be made.

Following the referential communication task, the subject and his partner were moved to a common table and sat facing one another. Dyads were given a list of five topics (movies, television, music, sports and hobbies) from which they were instructed to choose one that they would discuss for 10 minutes. They were informed that they could choose any topic from the list so long as they would be able to discuss the topic for the full 10 minute period. One week following the two communication tasks, subjects were asked to complete the Self-Perception Profile for Children. Finally, the WISC-R scores for the learning disabled subjects and the Cognitive Abilities Test scores for the nondisabled subjects were obtained from school personnel for analysis.

Measures

Information concerning subjects' communicative abilities, affective characteristics and cognitive processing skills was gathered by five measures. Communicative skills were assessed through a referential communication task and a semi-structured dyadic interaction. Affective characteristics were measured through the use of Harter's Self-Perception Profile for Children (1983). Finally, information concerning subjects' IQ and cognitive processes was derived from their performance on the WISC-R for the learning disabled subjects and from the Cognitive Abilities Test (1982) for the nondisabled subjects.

Scoring

Referential Communication Task: Each of the 8 figure descriptions produced by the subjects were scored on three dimensions: 1) degree of success, 2) efficiency of the descriptions and 3) content of the initial

description. Both degree of success and efficiency of description were scored in terms of the number of descriptions needed by the listener to make a correct figure selection. The content of the description was scored for the number of different attributes (color, number, size, label) incorporated into the subject's initial description. Scoring was conducted by two raters blind to subject status, that is, learning disabled or nondisabled. Interrater reliability, established prior to data analysis on a subset (20%) of subjects, was 100%.

Semi-Structured Dyadic Interaction: Transcribed semi-structured dyadic discussions were initially coded according to the 7 categories and 30 items comprising the dyad coding scheme (see Appendix A). Based on the coded transcripts, frequency counts and calculations were made as required by the nature of the item being scored. Subjects received two scores for this measure: standard scores for each of the 30 items and an overall communicative interaction score which was the sum of the standard scores for three items: proportion of contingent responses, proportion of projective turns and use of followup utterances. Scoring of the discussions was conducted by two raters blind to subject status (i.e., learning disabled or nondisabled). Interrater reliability was obtained on a random sample of 20% of the protocols and ranged from .89 to 1 on individual items, with an overall measure reliability of .96.

Self-Perception Profile for Children: Items on the "Self-Perception Profile for Children" were scored on a 4-point scale with 4 indicating the most adequate self-judgment and 1 representing the least adequate self-judgment (Harter, 1983). Items within each subscale are counter balanced such that three items are worded with the most adequate statement on the left and three items are worded with the most adequate statement on

the right to minimize presentation bias. The three subscales that were of interest to this study, social acceptance, behavior/conduct and self-worth were scored according to this scale, and resulted in each subject receiving 3 separate scores.

Measures of Cognitive Ability: The score obtained by each nondisabled subject for General Cognitive Ability on the CAT was taken from school records for use in the study. For the learning disabled subjects, Full Scale IQ scores from the WISC-R were obtained from school records. IQ scores were used not only to match subjects between groups, as well as subjects and partners within groups, but also as the measure of intellectual ability needed for the exploratory question addressing the relationships among the communicative, affective and cognitive measures. Additionally, the three WISC-R subtests on which each learning disabled subject received the lowest scores were identified for use in exploring the possibility of subgrouping the disabled subjects on the basis of their communicative, affective and cognitive abilities.

Results

Hypothesis 1, that nondisabled subjects would exhibit more mature and appropriate communicative behaviors than disabled subjects in both the referential and semi-structured dyadic communication tasks was tested by first evaluating the subjects' performances on the referential task and then on the dyadic interaction task. To determine general group differences on the referential communication task, three separate one-way analyses of variance (ANOVA) by group were conducted on the overall scores (sum of scores for the 8 target figures) for the degree of success, efficiency of descriptions and content of descriptions dimensions. On both the success,

$F(1, 59) = 9.33$, $p<.01$, and efficiency scores, $F(1, 59) = 10.30$, $p<.01$, scores nondisabled subjects were found to perform significantly better than the learning disabled subjects. No significant group differences were found for the content of descriptions produced by subjects in this task ($F(1, 59) = 1.28$ $p=.26$).

To determine if familiarity with figure type differentially influenced subject performance on this task, three separate 2 (group) x 2 (figure type) ANOVAs were conducted on the degree of success, efficiency of descriptions and content of descriptions dimensions. Main effects for both group and figure type were found for the degree of success dimension. Regardless of figure type, nondisabled subjects received significantly higher success scores than their disabled peers ($F(1, 119) = 4.21$ $p<.05$). Further, significantly higher success scores were obtained by all subjects for their descriptions of familiar rather than abstract figures ($F(1, 119) = 4.21$ $p<.05$). In terms of the efficiency of description dimension, a main effect for figure type was found ($F(1, 119) = 4.46$ $p<.05$). Regardless of status, subjects scored significantly higher on the efficiency dimension of their descriptions of familiar than abstract figures. Neither a main effect for group ($F(1, 119) = 3.2$ $p=.07$) nor a group x figure type interaction effect ($F(1, 119) = 1.5$ $p=.21$) was found for the efficiency of description dimension.

No significant main or interaction effects were found for the content of descriptions produced by the subjects (Group: $F(1, 119) = 1.28$ $p=.26$; Figure Type: $F(1, 119) = 2.98$ $p=.11$; Group x Figure Type Interaction: $F(1, 119) = 2.53$ $p=.18$). A Chi square analysis was conducted to determine if the frequency of the use of the four attributes (color, number, size, label) making up the content of description dimension differed as a function of

figure type. The analysis indicated that the attributes of color and size were used significantly more in subjects' descriptions of the abstract figures, while the attributes of number and size were most frequently used in descriptions of familiar figures ($X^2 = 15.87$ $p<.001$).

Hypothesis 1 also addressed subjects' performance on the Semi-Structured Dyadic Interaction. Differences in the overall communicative interaction scores obtained by subjects in the dyadic interaction were tested through the use of a one-way ANOVA by group. Results indicate no significant differences between the communicative interaction scores obtained by the learning disabled and those of the nondisabled subjects ($F(1, 59) = .427$ $p=.61$). However, familiarity with one's conversational partner was found to influence subjects' Communicative Interaction Score. Both disabled and nondisabled subjects interacting with familiar partners received a higher CIS than did subjects interacting with unfamiliar partners (Disabled: $F(1, 29) = 23.77$ $p<.001$; Nondisabled: $F(1, 29) = 34.63$ $p<.001$).

Group differences in the specific items making up the Dyadic Interaction Coding/Scoring Scheme were also tested. Group differences in values for three items, total interaction time, total turns (both subject and partner) and total subject utterances, were investigated through a multiple analysis of variance (MANOVA). This analysis indicated a main effect for group ($F(1, 179) = 4.85$ $p<.05$), and subsequent analyses of variance identified a significant group difference in total turns. There were a higher number of total turns among dyads with nondisabled subjects than in dyads with learning disabled subjects ($F(1, 59) = 2.5$ $p<.05$).

Group differences in the types of utterances produced by the subjects were tested through the use of MANOVA. Although no main effects were found

in this analysis (Group: $F(5, 359) = 1.4$ $p=.24$; Utterance Type: $F(5, 359) = 1.1$ $p=.31$), there was a significant group x utterance type interaction ($F(5, 359) = 2.24$ $p<.05$). Subsequent analyses of variance indicated that nondisabled subjects more frequently employed turnabouts than did disabled children ($F(1, 59) = 6.57$ $p<.01$).

To determine group differences in the degree and sophistication of subjects' responsiveness to their conversational partners, differences in the proportions of contingent responses, on-topic comments, non-responses, projective turns and turnabouts were tested through the use of MANOVA. Again, although no main effects were found, there was a significant group x item interaction ($F(5, 359) = 2.25$ $p<.05$). Followup analyses of variance indicated that nondisabled subjects evidenced a significantly greater proportion of turnabouts by turn ($F(1, 59) = 7.03$ $p<.01$) as well as a higher proportion of turnabouts by contingent responses ($F(1, 59) = 7.52$ $p<.01$). Additionally, the proportion of non-responses was significantly greater in the learning disabled subjects' conversations than in those of the nondisabled subjects ($F(1, 59) = 5.20$ $p<.05$).

Three separate one-way ANOVAs by group were conducted for the proportion of non-conversation, frequency of non-responses and use of followup utterances items. Dyads composed of a learning disabled subject were found to produce significantly higher proportions of non-conversation ($F(1, 59) = 6.44$ $p<.01$) than dyads composed of nondisabled subjects. Learning disabled subjects' conversations were also found to contain more non-responses to a partner's queries when compared to the nondisabled subjects ($F(1, 59) = 5.30$ $p<.05$).

Finally, to determine if a subject's group membership influenced his partner's behaviors, a series of separate one-way ANOVAs was carried out on

the 6 partner items. In the dyads in which the subject was nondisabled, partners were found to not only produce significantly more utterances (F (1, 59) = 4.36 $p<.05$), but also to share a greater proportion of the total interaction time as compared to the partners of the learning disabled subjects ($F(1, 59) = 4.53$ $p<.05$). However, in the interactions in which the subject was learning disabled, partners were found to be significantly more cooperative than the partners of the nondisabled subjects ($F(1, 59) = 6.99$ $p<.01$).

Hypothesis 2, that group differences would be found not only in the subjects' level of performance across the 5 communication task scores (i.e. success and efficiency scores for the abstract referential figures, success and efficiency scores for the familiar referential figures and the communicative interaction score derived from the semi-structured dyadic interaction) but also in the patterns of performance across the communication tasks, was tested by an analysis of variance. A 2 (group) x 5 (communication task score) repeated measure ANOVA indicated significant group differences in performance levels across the 5 communication task scores ($F(1, 179) = 7.51$ $p<.05$). That is, nondisabled subjects scored significantly higher than the disabled subjects regardless of the communication task. To identify group performance patterns across the communication tasks, the mean standardized scores for each group on the 5 communication tasks were rank ordered. These performance patterns, ordered from highest to lowest mean, standardized score are presented in Table 1.

Insert Table 1 About Here

Hypothesis 3, that nondisabled subjects would report higher self-perceptions in the areas of social acceptance, behavior/conduct and general self worth than would disabled subjects, was tested by three separate one-way ANOVAs by group. Main effects for group were found on Harter's (1983) subscales of social acceptance ($F(1, 59) = 4.12$ $p<.05$), behavior/conduct ($F(1, 59) = 11.06$ $p<.001$) and self worth ($F(1, 59) = 14.57$ $p<.001$). Nondisabled subjects, in comparison to the disabled subjects, were found to report higher self-perceptions on the three affective indices believed related in some fashion to communcative ability.

The first exploratory question investigated by this study addressed the interrelationships among subjects' IQ, their performances on the two communication tasks and the affective measures. These interrelationships were explored through multiple correlations. A correlation matrix specifying the direction and strength of the relationships among the variables was formulated for all subject data, as well as for each group of subjects. The three correlation matrices calculated to this end, with significant correlations identified, are presented in Tables 2a - 2c. It should be noted that high positive correlations are to be expected between certain items (e.g. Total Content and Abstract Content) given the fact that one score is made up, in part, by the other. Additionally, certain other items are also inherently related in that one is calculated on the basis of the other (e.g. Efficiency is based on Success). It is also important to realize that while statistically significant, many of the reported correlations are quite weak.

Insert Tables 2a-2c About Here

The second exploratory question addressed by this study investigated the feasibility of identifying subgroups of learning disabled children on the basis on their IQ, performance on the communication tasks, the affective measure and the three WISC-R subtests on which they received their lowest scores. In order to address this question, all raw scores were standardized in relation to the nondisabled subjects' performances on these variables. Subjects' individual scores, with the exception of the three WISC-R subtests, were each classified as High (1), Average (2) or Low (3) based on how far the score fell from the mean established from all subject scores. Scores falling more than one standard deviation above the mean were scored as High (1), while those falling more than one standard deviation below the mean were scored as Low (3). Scores that fell within one standard deviation around the mean were scored as Average (2). As it would not be practical to attempt to classify the subtests in the same manner as the numeric values obtained in the other measures, learning disabled subjects were initially compared on the basis of their IQ, communication task scores, and the affective measure.

This rather descriptive approximation, summarized in Table 3, and presented in greater detail in Appendix B, indicated that there was no consistent pattern of subgroup membership that could be derived from the scores obtained by the learning disabled subjects. To determine if this lack of consistency was unique to the disabled subjects, a similar division of standard scores into High, Average and Low groups was carried out for the nondisabled subjects. As can be seen in Table 3, the nondisabled subjects' scores were as, if not slightly more, randomly divided among the three groups as those of the learning disabled children. Based on these findings, no further analyses attempting to identify subgroups of learning disabled

children on the basis of their performances across the measures were deemed warranted.

Insert Table 3 About Here

Discussion

The results of this study provide at least partial support for the hypotheses that the communicative abilities and related self-perceptions of learning disabled children differ markedly from those of nondisabled children. Generally, the results reported concerning the subjects' performance on the referential task portion of Hypothesis 1 are in accordance with prior research (e.g., Asher, 1978), in that subjects were more successful when describing familiar as opposed to abstract figures. In addition, familiarity with one's conversational partner, a factor previously identified as influencing learning disabled children's success in communicative interactions (e.g., Pearl, Donahue & Bryan, 1981) was found to play a role in these subjects' success on the referential task. Although no apparent relation between familiarity with one's partner and one's success on the referential task was found for the nondisabled subjects, analysis of variance indicated a significant effect for familiarity on success for the disabled subjects ($F(1, 29) = 4.24$, $p<.05$).

Additionally, as was the case in previous research (e.g., Bryan & Pflaum, 1978), differential group performance on the referential task was found in this study. Learning disabled subjects were once again found to be significantly less successful and efficient in formulating discriminating and understandable figure descriptions than their nondisabled peers.

However, contrary to prior reports (e.g., Noel, 1980; Speckman, 1981), the lower success and efficiency scores obtained by the learning disabled subjects in this study cannot be accounted for by group differences in the content of the figure descriptions. Although the content of descriptions were found to differ as a function of figure type, learning disabled subjects were found to produce descriptions similar in nature to those formulated by the nondisabled subjects. That is, descriptions were produced by the disabled subjects that assigned labels to the figures and incorporated the critical attributes of the referent.

In terms of the results pertaining to the subjects' performance on the dyadic interaction task portion of Hypothesis 1, serious concerns as to the adequacy of the Communicative Interaction Score must be expressed. In retrospect, and in light of the results of this study, it is apparent that attempting to characterize the "successfullness" or sophistication of a conversation on the basis of a single score derived from global properties of the interaction is inappropriate at best, and futile at worst. The learning disabled subjects in this study neither differed from the nondisabled subjects in the amount of time they interacted with their partners, nor in the use of a wide variety of utterance types in their conversations; gross characteristics of this task from which the Communicative Interaction Score was derived. However, a number of discrete behavioral differences in the quality of the subjects' interactions that were not reflected in the subjects' communicative interaction scores were suggested by the analyses.

One subset of items, dealing primarily with the level and degree of sophistication of subjects' interactions, was shown to distinguish the performances of not only the subjects, but their partners as well. What

appears to have differentiated group performance on this task is the manner in which the subjects participated in the dyadic interaction and the ways in which partners were engaged in the task. The interactions of the nondisabled children can be characterized as ones in which both subject and partner shared the responsibility of maintaining the interaction over the 10 minute period. As can be seen in Table 4a, the total interaction time for the nondisabled subjects' conversations was divided such that roughly 25% of the 10 minute period was devoted to nonconversation with the remaining 75% equally divided between subject and partner. Learning disabled subjects and their partners also had equal mean proportions of interaction time. However, because these dyads evidenced a relatively high proportion of nonconversation (32.4% vs. 24.5%), there was a more limited amount of time available for subject and partner conversation. This more restricted amount of time would account for the fewer total turns found for these dyads, as well as the fewer number of utterances and lower proportion of the interaction reported for the partners of disabled subjects.

Insert Table 4a About Here

One important difference between the groups' performances on this task centers on the amount of nonconversation occurring during the interaction. Post-hoc analysis of the nature of this nonconversation was conducted to determine how much of this time was actually devoted to silence, and how much was laughter or other sound effects. This refinement of the nonconversation item indicates more specifically the manner in which subjects and partners participated in the conversation. Prolonged periods of silence reflect a lack of engagement in the task whereas laughter or

sound effects indicate some participation, albeit relatively unsophisticated, in the interaction.

A breakdown of the total interaction time, with proportion of nonconversation divided into silence and laughter/other subcategories is presented in Table 4b. Such a breakdown highlights even greater group differences in degree of engagement than previously indicated. The finding that the dyads with a learning disabled child as subject had greater proportions of silence than those with nondisabled subjects helps account for some of the other group differences identified by data analysis. For example, the partners of disabled subjects were found to be more cooperative (i.e., ending their turns with a projective or a turnabout) than those of nondisabled subjects. This may indicate a response to the above normal level of silence in the interaction. That is, prolonged periods of silence frequently result in a breakdown in the communicative interaction and one technique for avoiding this breakdown is for one member of the dyad to take a more directive role in the interaction.

Insert Table 4b About Here

Related to the apparently excessive amount of silence typical to the interactions of the disabled subjects is the finding that these subjects did not engage in conversation maintaining strategies that are as sophisticated as those employed by the nondisabled subjects. Four general levels of engagement in a conversational interaction, increasing in level of sophistication and responsiveness, can be identified: lack of any response to the partner (i.e., silence), simple responses to the partner's utterances, or simple statements not related to the partner's utterances

(i.e., contingent responses, on-topic comments), asking questions (i.e., projectives), and both responding to the partner's statements or questions and in turn engaging the partner by asking a question (i.e., turnabouts).

As previously indicated, interactions between the disabled subjects and their partners evidenced significantly higher proportions of silence than those of the nondisabled subjects. Initial analysis of the interactions suggested no group differences in frequency of use of either contingent responses, on-topic comments or projectives. However, closer examination of the subjects' conversations indicates that some projectives were used in what can best be described as a nonproductive fashion. That is, 19.7% of the total number of projectives used by the disabled subjects, and 3.8% of those used by the nondisabled subjects were not presented in a manner that allowed them to fulfill their function - allowing the partner to become involved in the interaction by answering a question. Rather, these projectives were embedded within contingent responses and on-topic comments in such a way as to indicate that although the subject was asking a question, he was not interested in his partner's response. Consider, for example, this passage from a 10 year old learning disabled subject:

> ... and the substitute teacher we have - do you like her? - I don't - I mean I really can't stand her because ...

In essence, this subject asked a question, answered it herself, and by continuing on with her own thoughts, did not give her partner the opportunity to respond . Finally, as previously reported, learning disabled subjects were significantly less frequent users of turnabouts, the most sophisticated engagement technique investigated in this study.

In terms of level of engagement then, the learning disabled subjects' interactions most typically contained lower level techniques (i.e., silence,

simple responses). The primary difference between subject groups on this task appears to be rather subtle and not easily identified on the basis of an overall task measure. Although disabled subjects talked as much as their nondisabled peers, and for the most part with the same types of utterances, they differed greatly from the nondisabled subjects in terms of their level of engagement. Disabled subjects were able to talk about the topic, and when asked questions, respond. However, their interactions did not reflect an awareness that a conversation requires from its participants a mutual "give and take," a sharing of the task such that both members ask and answer questions, respond to and seek a response from the partner.

Conclusion

Although specific group differences in communicative ability were identified in this study, in many ways, learning disabled children's communications proved to be quite similar to those of nondisabled children. In fact, gross comparisons of abilities suggest that these two groups of children are more similar than they are different. Both groups of children are able to describe referents, talk as much about topics using similar types of utterances, and exhibit an understanding of the general rules that govern communicative interactions. However, the data obtained in this study suggest more subtle between and within group differences that center around the use of sophisticated strategies that enable a child to productively and comfortably engage in communicative interactions.

If, in fact, the major factor discriminating the communications of learning disabled from those of nondisabled children is the use of strategies - whether to narrow comparisons in a referential task or to maintain a conversation with a peer - the question of interest becomes one

that focuses on why learning disabled children do not employ the same strategies as nondisabled children. Future research should focus on investigating the nature and function of strategy use differences in disabled children, for in spite of the almost overwhelming complexity of linguistic and social knowledge that underlies successful communicative interactions (e.g., Keenan & Schieffelin, 1976), subtle violations of these rules are easily identified by conversational partners. Further, evidence exists that suggests that individuals form rapid and frequently negative impressions about other individuals who follow communicative rules that differ from what is expected (Gumperz & Tannen, 1978). As a result, those people who interrupt their partners, who fail to give or respond to feedback, or who produce ambiguous remarks and non sequiturs are not likely to be popular conversational partners. This, in turn, can not help but result in additional social, communicative and in the case of school aged children, academic difficulties.

Table 1: Subjects' Performance Patterns
Across Communication Tasks

Nondisabled Subjects	
Success Score, Abstract Figure	.25*
Efficiency Score, Abstract Figure	.23
Communicative Interaction Score	.15
Success Score, Familiar Figure	.09
Efficiency Score, Familiar Figure	.06
Learning Disabled Subjects	
Efficiency Score, Familiar Figure	-.06
Success Score, Familiar Figure	-.09
Communicative Interaction Score	-.15
Efficiency Score, Abstract Figure	-.24
Success Score, Abstract Figure	-.25

* numbers reflect mean, standardized scores

Table 2a: Correlations for All Subjects

	CIS	TOT SUC	TOT EFF	TOT CON	FAM SUC	FAM EFF	FAM CON	ABS SUC	ABS EFF	ABS CON	SOC ACC	BEH CON	SELF WOR
IQ	---	.27*	.255*	---	---	---	---	---	---	---	---	---	---
CIS		.303*	.284*	---	---	---	---	.312*	.277*	---	---	---	---
T.SUC			.952**	.480**	---	---	---	---	---	---	---	---	---
T.EFF				.510**	---	---	---	---	---	---	---	---	---
T.CON					---	---	---	---	---	---	---	---	---
F.SUC						.973**	.515**	---	---	---	---	---	---
F.EFF							.538**	---	---	.209*	---	---	---
F.CON								---	---	.505**	---	---	---
A.SUC									.991**	---	---	---	---
A.EFF										---	---	---	---
A.CON											---	---	---
SOC.A												---	---
B/C													---

*p < .05
**p < .01

Table 2b: Correlations for Nondisabled Subjects

	CIS	TOT SUC	TOT EFF	TOT CON	FAM SUC	FAM EFF	FAM CON	ABS SUC	ABS EFF	ABS CON	SOC ACC	BEH CON	SELF WOR
IQ	---	---	---	---	---	---	---	---	---	---	---	---	---
CIS		---	---	---	---	---	---	---	---	---	---	---	---
T.SUC			.967**	.435*	.638**	.599**	.474**	.671**	.675**	---	---	---	---
T.EFF				.460*	.663**	.644**	.453**	.657**	.674**	---	---	---	---
T.CON					.605**	.592**	.904**	---	---	.896**	---	---	---
F.SUC						.995**	.646**	---	---	.450**	---	---	---
F.EFF							.640**	---	---	.455*	---	---	---
F.CON								---	---	.652**	---	---	---
A.SUC									.959**	---	---	---	---
A.EFF										---	---	---	---
A.CON											---	---	---
SOC.A												---	---
B/C													.634**

*p < .05
**p < .01

Table 2c: Correlations for Learning Disabled Subjects

	CIS	TOT SUC	TOT EFF	TOT CON	FAM SUC	FAM EFF	FAM CON	ABS SUC	ABS EFF	ABS CON	SOC ACC	BEH CON	SELF WOR
IQ	---	---	---	---	.394*	.377*	---	---	---	---	---	---	---
CIS		---	---	---	---	---	---	---	---	---	---	---	---
T.SUC			.875**	.591**	.439*	.447**	.531**	.755**	.739**	.472**	---	---	---
T.EFF				.421*	---	---	.452*	.523**	.531**	---	---	---	---
T.CON					---	.362*	.548**	.558**	.581**	.847**	---	---	---
F.SUC						.995**	.433*	---	---	---	---	---	---
F.EFF							.441*	---	---	---	---	---	---
F.CON								.375*	.394*	.439*	---	---	---
A.SUC									.990**	.572**	---	---	---
A.EFF										.592**	---	---	---
A.CON											---	---	---
SOC.A												---	---
B/C													.406*

*p < .05
**p < .01

Table 3: Summary of Subgroup Classification

	Disabled Subjects	Nondisabled Subjects
All scores fall into 1 classification	3 (10%)	2 (6.7%)
Scores divided between 2 classifications	18 (60%)	17 (56.7%)
Scores divided among 3 classifications	9 (30%)	11 (36.7%)

Table 4a: Mean Proportion Interaction Time by Group

	Nonconversation	Subject	Partner
Disabled Subjects	32.38%	33.85%	33.48%
Nondisabled Subjects	24.51%	36.48%	38.66%

Table 4b: Mean Proportion Interaction Time by Group with Nonconversation Refined

	Silence	Laughter/Other	Subject	Partner
Disabled Subjects	27.81%	4.57%	33.85%	33.48%
Nondisabled Subjects	6.64%	17.87%	36.48%	38.66%

Appendix A: Dyadic Interaction Coding Scheme

General Characteristics of the Interaction

1. Total Interaction Time: amount of the 10 minute period devoted to discussing the chosen topic.
2. Proportion Non-Conversation: amount of the 10 minute period characterized by silence or laughter.
3. Total Turns: number of turns for both the subject and partner per 10 minute period. A turn is defined as an unbroken sequence of one child's utterance. A sequence is considered unbroken if less than 3 seconds intervenes between utterances. A turn is ended by a 3 second pause or by the onset of the partner's utterance.

General Subject Characteristics

1. Proportion Interaction Time: amount of time subject speaks divided by the total interaction time.
2. Proportion Subject Turns: total number of subject turns divided by the sum of both subject and partner turns.
3. Total Utterances: total number of utterances produced by the subject per 10 minute period.
4. Average Number of Utterances per Turn: total number of utterances produced by the subject during the 10 minute period divided by the total number of subject turns occuring during the 10 minute period.

Types of Utterances

1. Contingent Responses: a subject's response is considered contingent if it refers to the partner's immediately preceeding utterance, or to any activity in which the pair were engaged just prior to the time of the subject's utterance.
2. Comments: a subject's response is considered a comment if it is not contingent on a preceeding response. Two forms of comments will be scored:
   a) comments which deal with the topic being discussed but which do not refer to a preceeding utterance. The most common example of these would be utterances which change the subject.
   b) comments which are off-topic.
3. Projectives: subject responses that are on topic and which imply or demand a verbal or nonverbal response from the partner.
4. Turnabouts: subject responses that both respond to an immediately preceeding utterance and imply or demand a verbal or nonverbal response from the partner. Turnabouts are made up of contingent responses and projectives.
5. Reinforcers: verbalizations acting to display person's awareness of the discussion (ex. umm hmm, yeh).
6. Fillers/False Starts: Portions of statements that do not contain a complete idea or such words as "umm...", "like..."
7. Repetition: utterance that restates a portion of the other person's immediately preceeding statement or question.
8. Non-response: number of partner's utterances that are not responded to by the subject.

Appendix A, continued: Dyadic Interaction Coding Scheme

Degree and Sophistication of Responsiveness

1. Proportion Contingent Responses: number of subject's contingent responses divided by total number of opportunities to respond (sum of contingent responses, comments and non-responses).
2. Proportion On-Topic Comments: number of subject's on-topic comments divided by total number of opportunities to respond (sum of contingent responses, comments and non-responses).
3. Proportion of Non-responses: number of subject's non-responses divided by total number of opportunities to respond (sum of contingent responses, comments and non-responses).
4. Proportion Projective Turns: number of subject's turns ending in a projective divided by the subject's total number of turns.
5. Proportion Turnabouts: two scores:
   a) number of turnabouts divided by the total number of subject's turns.
   b) number of turnabouts divided by the total number of subject's contingent responses.

Persistence

1. Use of Followup Utterances: number of followup utterances produced by subject divided by the total number of opportunities to use followup statements. A followup utterance is one that repeats or restates an immediately preceeding utterance and occurs after the partner has failed to respond to the subject's previous utterance. Opportunity to use followup statements is determined by the number of subject utterances that are not responded to by the partner.

General Partner Characteristics

1. Proportion Interaction Time: amount of time partner speaks divided by the total interaction time.
2. Proportion Partner Turns: total number of partner turns divided by the sum of both subject and partner turns.
3. Total Utterances: total number of utterances produced by the partner per 10 minute period.
4. Average Number of Utterances per Turn: total number of utterances produced by the partner during the 10 minute period divided by the total number of partner turns occuring during the 10 minute period.

Partner Behaviors

1. Non-responses: number of subject's utterances which are not responded to by the partner.
2. Cooperativeness: number of partner's turns ending with a projective divided by the partner's total number of turns.

Appendix B: Subject Grouping by Task

Learning Disabled Subjects

Sub #	IQ	CIS	Success	Efficiency	Content	Soc.Accept	Beh/Con	SelfW.
3	2	2	2	2	2	3	2	3
10	2	2	2	2	2	2	2	2
16	3	2	2	2	2	1	2	1
17	2	2	2	2	2	3	3	3
18	2	2	3	3	2	2	2	2
19	2	2	3	2	2	2	2	2
20	3	1	2	2	2	3	2	3
21	3	2	1	1	2	2	2	2
22	2	2	2	2	2	1	3	1
23	3	2	3	2	2	1	2	1
24	2	2	3	3	3	2	2	2
25	2	3	3	3	2	3	1	3
26	3	2	2	2	2	2	3	2
27	2	3	2	2	1	2	2	2
28	2	2	2	2	2	3	2	3
43	2	2	1	1	2	2	2	2
44	1	3	2	2	2	2	2	2
45	2	1	1	1	1	2	2	2
46	2	2	2	2	2	3	3	3
47	3	2	3	3	3	3	3	3
48	2	2	2	2	2	3	1	3
49	3	3	3	2	2	2	2	2
50	2	2	2	2	1	2	2	2
51	2	2	2	2	2	2	2	2
52	3	2	2	2	2	2	2	2
53	3	2	2	2	2	2	2	2
54	2	2	2	2	2	3	2	3
55	2	2	2	2	2	2	2	2
56	1	2	1	1	1	2	2	2
57	2	2	1	1	2	2	2	2

1 - High: score falls more than one standard deviation above the mean
2 - Average: score falls within one standard deviation around the mean
3 - Low: score falls more than one standard deviation below the mean

Appendix B, continued: Subject Grouping by Task

Nondisabled Subjects

Sub #	IQ	CIS	Success	Efficiency	Content	Soc.Accept	Beh/Con	SelfW.
1	2	2	2	2	2	1	2	1
2	2	2	2	2	2	2	2	2
4	1	2	2	2	2	2	1	2
5	2	2	2	2	2	1	3	1
6	1	1	2	2	2	2	2	2
7	1	2	1	1	2	3	2	3
8	2	3	2	2	2	2	1	2
9	2	2	1	1	3	2	1	2
11	2	3	1	1	2	1	1	1
12	2	2	2	2	3	2	3	2
13	2	2	2	2	2	2	3	2
14	1	2	2	2	3	2	2	2
15	2	2	3	3	3	2	2	1
29	2	2	2	2	2	3	1	3
30	2	2	2	2	2	2	2	2
31	2	2	2	2	3	2	1	2
32	1	2	2	2	2	2	2	2
33	2	2	2	2	3	3	2	3
34	1	3	2	2	2	2	2	2
35	2	2	2	2	2	3	2	3
36	2	2	1	1	1	2	1	2
37	1	2	2	2	2	2	1	2
38	2	2	1	1	2	2	1	2
39	2	3	3	3	2	2	2	2
40	1	2	2	2	2	2	1	2
41	2	3	2	2	2	1	2	1
42	2	2	2	2	3	2	2	2
58	2	1	1	1	2	2	2	2
59	2	1	2	2	2	1	2	1
60	2	2	1	1	2	2	2	2

1 - High: score falls more than one standard deviation above the mean
2 - Average: score falls within one standard deviation around the mean
3 - Low: score falls more than one standard deviation below the mean

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